the Government has intervened to form State-aided companies, and British Dyes, Ltd., has its French analogue in the "Société Nationale des Matières Colorantes et Produits Chimiques." Meanwhile, private enterprise has played a very important part. The last surviving independent French dye factory at Saint-Denis has greatly increased its capital and organised its resources in order to deal intensively with dye production as soon as the claims of the explosives departments have abated. In Lancashire, Messrs. Levinstein, who have achieved noteworthy success as dye-makers, now form the nucleus of a group of co-ordinated firms working amicably in the production of dyes and other synthetic products. These firms, which include the Ellesmere Port indigo factory and Messrs. Claus, of Clayton, near Manchester, have working arrangements with other industrial undertakings not only in Great Britain, but also so far afield as Italy and America. This combination of the Lancashire colour firms and their associates is at present a most hopeful sign of renaissance for the chemical industries of the Entente Powers. G. T. MORGAN.

FRANCE AND NATIONAL SCIENTIFIC RESEARCH APPLIED TO INDUSTRY.

THE French Société d'Encouragement pour l'Industrie Nationale, always to the fore in matters of vital moment to industry, has recently been dealing with the question of scientific investigation as applied to manufacture. The "Economic Arts" Sub-Committee in particular is greatly interested in the co-ordination and co-operation of the various research and test laboratories in the country with the view of bringing science and industry into more direct contact after the war. In No. 1 (1917) of the society's Bulletin General Sebert has an article on the various establishments of the kind. Many of the Government departments in France have their own special laboratories, *e.g.* the various research laboratories of the French War Office and the Munitions Inventions Committee. A number of the scientific societies also have their own establishments, *e.g.* that founded by the Society of Electrical Engineers in 1886. Many tests are made there for different Government departments, and a number of important researches in electricity have been undertaken. Then there is the laboratory created by the French Photographic Society, which has done good work for the photographic profession and trade, and, more recently, for the kinematograph trade. By a decree passed in 1900 it was decided to widen the scope of the mechanical laboratory founded in 1854 by General Morin, the result being the foundation of the Laboratoire d'essais at the Conservatoire national des arts et métiers. To this institution many technical societies have made grants. It is divided into five sections, viz. physics, metals, materials of construction, mechanics, and chemistry. Here certain primary and secondary standards are kept. This laboratory has done good work in the carrying out of routine testing of all kinds, but its operations are evidently circumscribed through lack of funds. The laboratory had to close at the beginning of the war, though it has since been reopened at the instance of the Munitions Inventions Committee for the carrying out of experiments relating to war problems.

Useful as such establishments are, however, there is a strongly felt desire to establish in France a National Laboratory on the scale of our own National Physical Laboratory, the Bureau of Standards (U.S.A.), and the Reichsanstalt at Charlottenburg.

M. Armand Gautier, of the Institute, recently expressed at the Academy of Sciences his personal ideas regarding the creation of a central laboratory of the kind, and an epitome of his contribution is printed in the Bulletin of the Société d'Encouragement already referred to. He suggests the formation of a council consisting of manufacturers of the first rank, scholars who are specialists in particular branches of science, and a small number of Ministers of State or members of the National Council. This council would draw up a list of the questions to be dealt with and appoint the most eminent men to carry out the investigations. The council would also approach the manufacturers, etc., who would be most likely to benefit from the researches, and the latter would do the rest by the provision of annual grants for the execution of the work. The State would have no responsibility, direction, or supervisory powers, but would provide the funds necessary for the establishment and equipment of the institution. Each manufacturer would undertake to assist according to the extent of his business, but the share of each would be fixed as low as possible. M. Gautier thinks that there would be no difficulty in inducing manufacturers to lend their support, as it is they who would most directly profit from the results of the researches. E. S. HODGSON.

NOTES.

A CORRESPONDENT in Petrograd gives us a rather gloomy account of the difficulties of carrying on scientific work or publications under the present conditions in Russia. He says:—"It is, in fact, now almost impossible to print here scientific works having small circulations, as the prices demanded by the compositors, printers, papermakers, and other workers connected with the production of books are 200–300 per cent. higher than they were in February, immediately before the Revolution. The results are beginning to be felt already—factories are being closed and the number of unemployed getting larger every day. Scientific work and teaching are at present almost impossible, as many of the institutes and universities are 'requisitioned' by irresponsible revolutionary organisations and troops; thus the Polytechnic Institute has been occupied since March 5 by about 2500 soldiers, and as the sanitary arrangements were never intended for such a number of people, having no ideas of sanitation, living and sleeping in the lecture- and drawing-halls, the shameful state of the institute may be imagined. All efforts to eject these unwelcome guests and those of other organisations have proved abortive, as the 'Provisional Government' has no power to do it. Almost all courses of lectures are thus interrupted, and it is possible to conduct only some laboratory exercises and examinations. The students themselves take a large part in the different revolutionary organisations, and also make demands to have the direction and control of all the affairs of universities and institutes. The future of our seats of learning seems precarious indeed, as there are no visible signs of order succeeding the general anarchy, which, as of course you know from the daily papers, reigns everywhere supreme."

IT was suggested in NATURE of May 24 (p. 250) that the atmospheric conditions in this season of the year would probably favour observations on the transmission to this country of the sound of firing from the Western front. This anticipation has been realised, for on several occasions during the past six weeks the reports of continuous distant firing have been noticed in the London district. Dr. H. S. Allen, who previously recorded hearing the sounds from Chessington, informs us that sounds of bombardment were noticed by several observers at New Malden on June 3, 4, and 5. More recently he has heard the characteristic sounds on several occasions from Graffham Common, in West Sussex. The common lies between Petworth and Midhurst, on the north side of the South Downs. The reports are usually most distinct in the evening, and were heard very clearly on the still evenings of June 21 and 22. The German bombardment on the Nieuport front on July 10 accounts for the specially distinct reports heard from 5 p.m. on that date. The *Evening Standard* of July 11 states that between Horsham and West Grinstead the terrific gunfire in Flanders was heard more distinctly on the previous day than at any time during the war. The reports can be recognised readily by the frequency of their occurrence, the usual interval between successive reports being only a few seconds, and by the peculiar character of the concussion, which may be said to be felt rather than heard. According to a correspondent of the *Manchester Guardian* (July 12), persons on the higher ground to the north of London heard "the strange, heavy sound, that was like the muffled slamming of colossal doors." Further evidence with regard to the sound of the Messines mines is given in the first German account of the battle (quoted in the *Times* for July 14). The most marked feature of the explosion, according to an observer one kilometre from the northernmost mine, was the movement of the ground. The blow was accompanied "by a terrible crash, not so very loud, but so powerful and of such a kind as has never been heard after the explosion of the heaviest enemy shell or mine torpedo."

OWING to conditions resulting from the existing war, the International Exchange Service of the Smithsonian Institution, of Washington, is temporarily discontinued to almost all the countries of Europe and to India.

AT a meeting of the council of the Ray Society held on July 12, Dr. B. Daydon Jackson, vice-president, in the chair, the resignation as treasurer of Dr. DuCane Godman on account of ill-health was announced. The thanks of the council for his services during the past fourteen years were accorded to him, and Dr. S. F. Harmer was elected treasurer in his place.

DR. J. SCOTT KELTIE has retired from the editorship of the *Geographical Journal*, a position which he retained jointly with Mr. A. R. Hinks since his retirement from the secretaryship of the Royal Geographical Society two years ago. The *Journal* was founded in its present shape in 1893, a year after Dr. Keltie became assistant secretary and editor. On his retirement, after thirty-two years in the service of the society, Dr. Keltie has been elected a member of the council and awarded the society's Victoria medal for geographical research.

THE death is announced, at the age of seventy-eight, of Dr. J. M. Crafts. A graduate of the Lawrence Scientific School at Harvard, he studied chemistry afterwards at Freiberg, Heidelberg, and Paris. For many years he occupied a chair of chemistry in Cornell University, and from 1898 to 1900 he was president of the Massachusetts Institute of Technology. Since the latter date he had been engaged in chemical research in Boston. In 1885 Dr. Crafts was awarded the Jecker prize by the Paris Academy of Sciences, and was made a chevalier of the Legion of Honour. He had published researches upon organic silicium compounds, arsenic, ethers, studies in thermometry, catalytic reactions in concentrated solutions, etc.

PROF. E. G. HILL, principal of Muir College, University of Allahabad, died on June 28 at Naini Tal, India, at the age of forty-five. He was the son of the Rev. George Hill, D.D., of Nottingham, and was educated at Leeds, and later at Magdalen College, Oxford, whence he entered in 1895 the Indian Educational Service as professor of chemistry at Muir College. Shortly afterwards he became a fellow of Allahabad University, and the dean of the science faculty, and in 1913 was appointed principal of his college. He contributed a number of original papers on a variety of chemical subjects to the Transactions of the Chemical Society between the years 1903 and 1907. Among these may be mentioned:—Analysis of reh (natural alkaline salts); hydrolysis of ammonia salts by water; the coloured constituents of *Butea frondosa;* and a new colouring matter from *Nyclanthes arbor tristis.* He also acted as meteorologist to the United Provinces Government.

ORNITHOLOGISTS will learn with a mixture of regret and pride of the death of Mr. Eric B. Dunlop, who was killed in action on May 19. Born and bred in the Lake District—he was the eldest son of Mr. A. B. Dunlop, J.P., of Windermere—his innate love of birds found an exceptionally fine field for development, and he made the most of his opportunities, especially in regard to disappearing species, like the common buzzard, peregrine falcon, and raven. On the outbreak of war he was engaged upon a study of the nesting habits of birds in northern Manitoba, and coupled these investigations with a no less careful study of the fur-bearing mammals of Canada in regard to their seasonal changes and variation. In 1915 he decided to suspend his work and take his place in the fighting line, and accordingly enlisted in the 78th Canadian Grenadiers. But on his arrival in England he was transferred to the Border Regiment, and was in France barely a month before he fell. We who are left have lost a comrade whom we could ill spare.

IT will be remembered that in NATURE for January 25 of this year Prof. Eugenio Rignano had a letter on a suggested "quadruple scientific Entente." The French original of this letter also appeared in the *Revue générale des Sciences* for January 30, and has given rise to a good deal of discussion. In the *Revue* for June 15 Prof. E. Gley fully agrees with Prof. Rignano about the malady of the German hegemony of scientific literature, but advances some criticisms on the proposed means of dealing with this evil. Prof. Gley's examples are naturally taken from the literature of that branch of science—physiology—with which he is most familiar; and he points out that the general tendency of nations is to make the publication of scientific work more and more national. The attempt, chiefly apparent, it seems—at least so far as physiology is concerned—in Germany, to publish the work of scientific men of other nations in their own languages is, according to him, a danger of monopoly hidden under the cloak of apparent internationalisation. Further, we must allow for a sextuple Entente, to include the United States and Japan; and it seems that this would increase the difficulty of making the projected journals suffice for their task. Ententist organisation is certainly desirable, especially for year-books of analysis of published work, but Prof. Gley brings forward certain difficulties in the matter, which are, however, it would seem, not insurmountable. An Ententist organisation of detailed "handbooks" of science, something like the best German books, seems to Prof. Gley much more possible. A second part of the article is devoted to the development of laboratories in Germany, which has played a great part in Germany's scientific hegemony, and to the lessons that France might learn in this respect. In the *Revue* for April 15 M. Ch. Marie suggested the path to be followed in the organisation of scientific records and other publications by the countries of the Entente.

THE *Archives of Radiology and Electrotherapy* for June (vol. xxii., No. 1) contains an article by Mr. H. C. Gage on simplified X-ray methods. The necessity in the present war of coping swiftly with a maximum of cases at a minimum of expense has led to the evolution of new ideas and the modification of old methods. The localisation of foreign bodies and the radiography of the limbs for fractures are dealt with at length. Attention is directed to the use of rapid bromide paper, with which it is possible to make good radiographs if an intensification screen be employed for the deeper parts. By its use economy is effected and weight for transport reduced.

THE *Indian Journal of Medical Research* for April (vol. iv., No. 4) contains a number of valuable papers dealing with a variety of subjects—bacteriological studies of cholera-like microbes, vitality of the tubercle bacillus outside the body, *rôle* of the blood in ovulation in mosquitoes, a substitute for "nutrose" (pea-nut flour, ninety-four parts; casein, five parts; sodium carbonate, one part), etc. Lieut. Mackenzie Wallis, R.A.M.C., describes a new test for chlorine in drinking water. This consists of an acid solution of benzidine or tolidine, which yield a yellow colour with so little as 0·005 part of chlorine per million of water, and do not react with chlorides. The same author has also investigated the ability of chloramine-T to sterilise water for drinking purposes. One drop of a saturated aqueous solution of chloramine-T (about a 15 per cent. solution) will sterilise two litres of water, containing an excess of organic matter, in thirty minutes. Water so treated has no unpleasant taste or smell, as is the case when bleaching powder and other hypochlorites are used.

MR. J. ARTHUR HUTTON gives an account of the investigations (which he has now carried on for many years) into the life-history of the salmon in the *Salmon and Trout Magazine* for April. The method of "scale-reading" is that mainly employed, and the results apply particularly to the River Wye, but there is also a general discussion of the Billingsgate Market statistics, and a strongly urged plea for the general improvement of the system of collecting salmon statistics throughout the United Kingdom.

THE Madras Fisheries Bulletin, No. 11, consists of a description of the edible molluscs found on the shores of the Presidency. Mr. Jas. Hornell, the writer, gives good accounts of the occurrence and natural history of each of the principal species, and adds a figure for each of the more important animals. Except in the case of the poorer classes of coast dwellers, shell-fish are either despised or neglected as articles of food in India—that is, in comparison with the littoral fishing industries of Britain, France, and Japan, for instance. But it also appears to be the case that the larger and more valuable edible molluscs of other parts of the world are either very small or absent on Indian shores, and the suggestion is made that the indigenous supplies should be supplemented by the introduction and cultivation of more valuable species. The report is written from this point of view.

A BRIEF but felicitous series of notes on the breeding habits of the merlin appears in *British Birds* for July by Mr. E. R. Paton. These cover the whole period, from the first appearance of the merlin on an Ayrshire moor to the disappearance of the young, three in number. The male seems to have taken no part in incubation until near the time of hatching. Both parents took part in feeding the young, but while the female kept to the moor, the male hunted largely for food in a neighbouring wood. Though the nest was in the middle of a grouse-drive, yet no young game-bird was ever killed by either of the parent birds. Incubation lasted thirty days, and did not commence until the full clutch of three eggs was laid. The young were apparently able to fly by the end of July —that is to say, when about one month old.

MR. W. H. T. TAMS, in the July issue of the *Entomologists' Magazine,* directs attention to the fact that while the noctuid moth, *Euplexia lucipara,* taken in the British Isles differs but little, in external appearance, from specimens taken in Canada, yet in the structure of the genitalia of the males the differences are of a very striking character. Being now on active service with the Canadian Army Corps, Mr. Tams remarks that he is, for the present, quite unable to carry his investigations further into this subject, and hence appeals to entomologists who may have opportunities for work of this description to make a careful study of specimens of this species drawn from widely different areas of its range, which is considerable, since it is found all over Europe and Asia, as well as in North America. Such an inquiry, he contends, would afford valuable data as to the relation between these structural differences in the genitalia and the geographical distribution of the individuals.

To the *American Naturalist* for April (vol. li., No. 604) Dr. P. Hadley contributes a valuable paper on the flagellate genus Trichomonas, usually a harmless parasite in the intestine of various animal hosts. Dr. Hadley states that these organisms multiply exceedingly in the intestines of diarrhœic turkeys, penetrate the epithelium, and, invading the tissues of the host, become intracellular parasites living in the manner of sporozoa and playing a pathogenic *rôle* associated with the disease known as "blackhead." The author does not state definitely if he considers that the protozoal parasites hitherto recognised as the cause of "blackhead," and regarded as *Eimeria avium,* are in reality stages in the life-history of Trichomonas. The questions raised are of much interest, and call for further elucidation.

THAT legislation enacted to secure the extermination of "vermin" in response to popular clamour is ever dangerous we have always held. Australia is now learning this to her sorrow. For thirty years compulsory poisoning laws have been in force, and the *Scientific Australian* for March, which has just reached us, now complains that, as a result of these laws, the carrion hawks, crows, and native carnivora have been well-nigh wiped out. As a consequence, decaying bodies are left to be demolished by blow-flies, which have now increased to such an appalling extent as to threaten the sheep on the runs with destruction, the animals becoming "fly-blown" and infested with the larvæ of this troublesome and dangerous insect. Similarly, the *Victorian Naturalist* for April relates that, for the last month or two, wheat buyers have been at their wits' end to protect the immense wheat stacks at country stations, especially in the Wimmera district, from mice, which have increased to an incredible extent. Most of the stacks have now been enclosed by sheets of galvanised iron, openings in which are left to correspond with kerosene tins, sunk in the ground, and partly filled with water. It is no uncommon occurrence to capture 10,000 mice in this way in a single night. At Minyip, recently, the catch for two nights weighed rather more than a ton. Australia would do well to follow the lead of Canada and the United States and appoint a Bureau of Economic Ornithology, which might also be charged with the task of inquiry into the status and usefulness, or otherwise, of such of the native carnivora as have escaped the unfortunate and ill-considered legislation which has brought about such disastrous results.

OF the many varieties of rice grown in India, some of the most interesting are the deep-water paddies grown in Orissa. Unlike other paddies, these deep-water forms of which eight are known to be cultivated, can endure complete submergence for seven to ten days without sustaining any material damage. As the water rises the plants keep growing, maintaining their heads above water, and plants 10–15 ft. long have been measured, yielding at the same time a bumper harvest. The value of these paddies is that land which would otherwise be unutilised, since at crop seasons it is always under water, is found to be admirably suited to them, and a good return has been realised, owing to the introduction of these deep-water forms, from land which formerly was valueless. The account of the deep-water paddy of Orissa is given in the Journal of the Department of Agriculture, Bihar and Orissa, vol iv., p. 66, by Mr. E. L. Rout, Inspector of Agriculture, Cuttack.

THE *Times Trade Supplement* for July contains some interesting statistics as to the production of potash salts and products in the United States in 1916. The total production represented 8830 tons of potash, of which 5750 tons were obtained from mineral sources and 3080 tons from organic sources. Of the former 3850 tons were obtained from natural salts or brines, and 1900 tons from alunite and silicate rocks, including recoveries from furnace-flue dusts. Of the potash from organic sources 1110 tons were obtained from kelp, 220 tons from pearl ash, and 1750 tons from miscellaneous industrial wastes. Canadian felspar, which has long been imported for use in pottery manufacture, is now imported by American manufacturers of fertilisers for use as potash manure. Portland cement works in Ontario are also producing potash as a by-product from the felspar used in making the cement. It is claimed that more than 80 per cent. of the potash of the felspar is recovered, and at a cost less than the freight charges paid on imported German potash before the war.

Two articles on the Near East in the July number of the *Geographical Journal* (vol. l., No. 1) are of special interest at the present time. The first, by Dr. E. W. G. Masterman, is on Palestine. Dr. Masterman, who knows Palestine well, and is secretary of the Palestine Exploration Fund, has no exaggerated views on the value of the country as a field for colonisation, and believes that the first needs of Palestine must be afforestation, irrigation, and the restoration of the terraces on the mountain-sides. Side by side with these efforts, he insists on an organised attack on the causes of the prevalent diseases—malaria, ophthalmia, dysentery, tuberculosis, and others. So far as present conditions go there is little room for increased population, and Dr. Masterman foresees no immediate opening for settlers on an extended scale after the war. The second paper is a long one, by Mr. H. C. Woods, on the Bagdad Railway and its tributaries. This paper deals also with the other railway lines and projects in Asia Minor, and with those in Syria so far as they act as feeders to the Bagdad line.

IN the Proceedings of the Cotteswold Naturalists' Field Club for 1916, p. 129, Mr. C. T. Gardiner gives a detailed study of the Silurian inlier on the east of the South Welsh coalfield between Usk and Pontypool. Dr. F. R. Cowper Reed describes and figures some new species from the area. The Wenlock Shales, it is urged, have a greater extension than appears on the Geological Survey map, while the Ludlow area is correspondingly reduced. A newly discovered outlier of Old Red Sandstone is indicated.

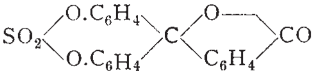
THE seventeenth report of the committee of the British Association on Photographs of Geological Interest appeared in 1910, and is now supplemented by the eighteenth report (1916), drawn up under the care of Prof. W. W. Watts and Prof. S. H. Reynolds. A large part of the interval has been unsuited for photographic work, especially along our coast-line, but valuable additions have been made from special localities, such as the series by Prof. Reynolds from the Carboniferous section in Burrington Combe, Somerset, following on his great Avon gorge series, and Mr. Godfrey Bingley's extensive studies of the Magnesian Limestone of Sunderland. Geologists desiring prints or lantern-slides from the negatives named in the lists now published are asked to communicate with the individual photographers, whose names and addresses are conveniently given.

THE study of earthquakes in California is in the hands of the Weather Bureau in that State, assisted by observers at twelve first-class stations and by 314 "climatological observers." The results for the year 1916 are contained in an interesting paper by Mr. A. H. Palmer, contributed to the Seismological Society of America (Bulletin, vol. vii., 1917, pp. 1–17). The total number of earthquakes recorded during the year is sixty-six, which exceeds the number felt throughout the rest of the United States. None of them attained a destructive intensity, and two-thirds were so slight that they were felt at one station only. They occurred more frequently near the coast than in the interior, the region of greatest frequency being that about Monterey Bay. At San Francisco there was only one very slight shock. A peculiar feature of these earthquakes is the comparative absence of the earthquake-sound, which is mentioned in only one-fifth of the records. The earthquakes are attributed generally to movements along the well-known faults which traverse the State in a south-easterly direction, but the evidence is too scanty to enable the author to assign an earthquake to any particular fault. The State of California is one of the most interesting seismic regions, and it is to be hoped that the Weather Bureau will not remain content until the network of stations is greatly expanded, especially in the Owens Valley, the Imperial Valley, Humboldt County, and in the districts surrounding San Francisco and Monterey Bay.

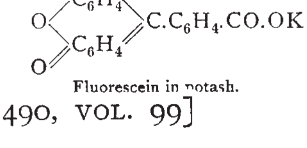
Science for June 1 contains an interesting address by Prof. G. A. Miller on the function of mathematics in scientific research. It is rather discursive, but contains many striking epigrams; for instance, "I would be inclined to say that *modesty* is the attitude of mind which has contributed most powerfully to mathematical progress"; "Unless we become like children in faith and fancy, we should not expect to add much that is fundamentally new to the kingdom of mathematics"; "Science is not primarily a grazing country; large tracts are suitable for agriculture and mining," and so on. One very remarkable discovery is referred to, namely, that the Maya people of Central America had a positional system of notation with various *different* signs for zero. While recognising the value of scientific organisation and the promotion of research, Prof. Miller gives the timely warning that "the greatest danger of research to-day is that its popularity tends to research hypocrisy." We may perhaps add to this that a good training in mathematics is one of the best preventives of hypocrisy and intellectual dishonesty of every kind. Finally, we may note that, in the speaker's opinion, mathematics is so far abreast of the time as to be ready to discuss the problems arising from our new views about the constitution of the physical world. This is good hearing, because Prof. Miller knows as well as any man alive the difference between analysis which deals with continuous variables and that which is concerned with discrete sets of elements.

A LECTURE on "Chemistry in Industry" was delivered at the Royal College of Science for Ireland, Dublin, on Tuesday, July 10, by Prof. Gilbert T. Morgan, who is now conducting a summer course in "Wool Dyes and Dyeing" under the auspices of the Department of Agriculture and Technical Instruction for Ireland. The relation between chemistry and the food-producing industries shows how essential it is to follow up every clue discovered in the laboratory in the hope that ultimately the discovery may prove to be of practical value. Chemistry is also intimately concerned in the production of cement, glass, and ceramic ware. Its services in the production of munitions of war are even more obvious. A remarkable characteristic of chemical industries is the tendency for the enterprises to become merged together, so that the waste products of one section become the raw material of another manufacture. It is only by encouraging this association of related industries that chemical manufacture can be conducted efficiently. Manufacturers of high explosives utilise their plant in the production of fine chemicals. Dye-producers drift into the manufacture of synthetic drugs and photographic chemicals.

DR. JAMES MOIR, in a paper read before the Royal Society of South Africa on "Colour and Chemical Constitution," describes the colour changes produced by substitution in some fifty derivatives of phenolphthalein and fluorescein. The most striking novelty in the paper is the discovery that when these substances are dissolved in concentrated sulphuric acid they give a coloration which is five times as intense as in alkali, and is produced by a band of lower wavelength, the frequency being half as fast again in sulphuric acid after allowing for a constant load due to combination of sulphuric acid with the oxygen of the dye. As, however, fluorescein in alkali and phenolphthalein in sulphuric acid give identical absorption bands, it is suggested that there is in each case a linking up of the phenolic rings, thus:—



Phenolphthalein in H_2SO_4.



Fluorescein in potash.

THE Journal of the Society of Engineers for May contains an account, by Lord Headley, of the goods clearing house system and machinery. It is now some eight or nine years since Mr. Gattie and Mr. Seamen introduced to public notice the extremely ingenious system of electro-magnetic machinery for dealing with heavy goods, and practical demonstrations have been given with full-sized machinery at the works of the New Transport Co., at Battersea. It is estimated that 97 per cent. of the life of railway wagons is spent standing still in sidings or shunting yards, and that 0.5 per cent. only is spent in running loaded. It is claimed that the goods clearing system would enable 80 per cent. of these wagons to be dispensed with. Official estimates of the surplus profits of the proposed London goods clearing house on its first year of working give a profit of 9,295,948*l*. on a capital outlay of 14,000,000*l*. It would appear that there are serious abuses due to railway mismanagement, and it is claimed that the new system would abate or do away with these. In brief, the system proposed is to collect all goods by motor lorries and to deliver them at one building instead of at many scattered stations. On arrival, the body of the lorry containing the goods is hoisted off by electric cranes, another body is dropped into place, and the lorry sets off immediately on another journey. The goods are sorted inside the house, according to their destination, by means of machinery, consisting of endless chains of trucks electrically controlled in such a way that goods may be picked up or deposited in any portion of the house. The control is effected from a central switch-board, and when the proper key is depressed the goods on the truck controlled are moved along and transferred to other trucks leading to other bays on the same floor, or up escalators to other floors. The goods are carried on trays, and the trucks are fitted with roller magnets which automatically transfer the trays at the proper instant. There is little doubt that such a system would go far to relieve the congestion in many London streets, and would dispense with a large amount—if not all—of the shunting operations at railway goods stations.

IT is announced that the "Dictionary of National Biography" has been presented to the University of Oxford by the family of the late Mr. George M. Smith, and will in future be published by the Oxford University Press.

OUR ASTRONOMICAL COLUMN.

THE RELATIVITY THEORY AND THE MOTION OF MERCURY'S PERIHELION.—The circumstance that especially attracted the attention of mathematicians to Einstein's new theory of relativity was the fact that it accounted for the whole excess of motion ($43''$ per century) of the perihelion of Mercury over that indicated by planetary theory. Dr. L. Silberstein, in a paper entitled "The Motion of the Perihelion of Mercury deduced from the Classical Theory of Relativity" (*Monthly Notices*, R.A.S., April, 1917), points out that it is not necessary for a relativity theory to explain the whole excess of Mercury's perihelion; part of it can reasonably be ascribed to the stratum of matter composing the zodiacal light. He himself prefers the older, simpler relativity theory, which he asserts to be unobjectionable in its foundations, and to accord well with observation in the field of physics. He notes that it would not indicate the bending of a ray of light in a gravitational field, as Einstein's does. It is hoped that this critical experiment may be made at the total solar eclipse of May, 1919.

In the classical relativity theory, as in Newtonian mechanics, the rate of increase of momentum *mv* is